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41,733

Reg. No.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of

Applicant : Krukonis et al.
Serial No. : (Divisional of Serial No. 09/342,284)
Filed :
Title : METHOD FOR MANUFACTURING PAPER HAVING VARIABLE CHARACTERISTICS
Docket : 300151-41150D1
Examiner :
Art Unit :

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Before examination, please amend this application as follows:

IN THE DRAWINGS:

Replace originally-filed Fig. 1 with the enclosed substitute Fig. 1.

Preliminary Amendment
Attorney Docket No.:300151-41150D1
Divisional of Serial No. 09/342,284

IN THE SPECIFICATION:

Amend the title to read --METHOD FOR MANUFACTURING PAPER HAVING VARIABLE CHARACTERISTICS--.

Page 1, line 3 add the following paragraph:--This application is a divisional of U.S. App. Serial No. 09/342,284, filed June 29, 1999, the contents of which are hereby incorporated by reference.--.

IN THE ABSTRACT:

Replace the originally-filed Abstract with the following replacement Abstract:

A method for manufacturing paper having a variable characteristic in a crossmachine direction including the steps of feeding a slurry to a distributor and delivering the slurry from the distributor to a headbox through a plurality of delivery lines. The delivery lines are coupled to the headbox at a plurality of locations spaced across the headbox in a crossmachine direction. The method includes selectively introducing a property altering agent in at least two of the delivery lines at the distributor to selectively alter the properties of the slurry passing through the at least two delivery lines. The method also includes the step of depositing the slurry received by the headbox on a papermaking wire to form paper.

IN THE CLAIMS:

Cancel claims 1-23 and 27-31.

Rewrite claims 24 and 32 such that they read as follows:

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24. (Amended) A method for manufacturing paper having a variable characteristic in a crossmachine direction comprising the steps of:

feeding a slurry to a distributor;

delivering said slurry from said distributor to a headbox through a plurality of delivery lines, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

selectively introducing a property altering agent in at least two of said delivery lines at said distributor to selectively alter the properties of the slurry passing through said at least two delivery lines; and

depositing said slurry received by said headbox on a papermaking wire to form paper.

32. (Amended) A security paper having colored stripes formed by the steps of:

feeding a slurry to a distributor;

delivering said slurry from said distributor to a headbox through a plurality of delivery lines, each delivery line being coupled to said distributor at a coupling location, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

selectively introducing a coloring agent in at least two of said delivery lines at the associated coupling location to selectively color the slurry passing through said at least two delivery lines; and

depositing said slurry received by said headbox on a papermaking wire to form striped paper.

Add the following new claims:

36. The method of claim 24 wherein said property altering agent is dissolved or suspended in a fluid to form a property altering agent solution before said introducing step, and wherein said property altering agent solution is introduced in said at least two delivery lines to selectively introduce said property altering agent in said at least two delivery lines.

37. The method of claim 24 wherein the slurry in said at least two delivery lines is diluted by dilution water, and wherein said dilution water selectively introduces said property altering agent in said at least two delivery lines.

38. The method of claim 24 wherein a plurality of dilution water lines are coupled to said plurality of delivery lines, said dilution water lines delivering dilution water to said plurality of delivery lines, and wherein said dilution water lines selectively introduce said property altering agent in said at least two delivery lines.

39. The method of claim 38 wherein each delivery line receives dilution water from an associated, dedicated dilution water line.

40. The method of claim 38 wherein each dilution water line delivers said dilution water from a water header to said delivery lines.

41. The method of claim 38 wherein said property altering agent is dissolved or suspended in a fluid to form a property altering agent solution, and wherein said property altering agent solution is introduced into selected ones of said plurality of dilution water lines to selectively introduce said property altering agent in said at least two delivery lines.

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42. The method of claim 41 wherein said property altering agent solution is pumped into said selected dilution water lines to thereby introduce said property altering agent into said selected dilution water lines.

43. The method of claim 41 wherein said selected dilution water lines each include a 3-way fitting to enable said property altering agent to be introduced therein.

44. The method of claim 36 wherein said property altering solution is added to said at least two delivery lines at a rate of between about 0.5 and about 4 gallons per hour.

45. The method of claim 36 wherein said property altering agent constitutes about 0.5 percent to about 50.0 percent concentration by volume of said property altering agent solution.

46. The method of claim 24 wherein the slurry delivered by each delivery line contributes to a portion of the width of the deposited slurry in the crossmachine direction.

47. The method of claim 24 wherein said slurry is comprised of cellulose fibers suspended in a water base.

48. The method of claim 24 wherein said property altering agent is a dye.

49. The method of claim 24 wherein said property altering agent is a pigment.

50. The method of claim 24 further comprising the step of suspending said property altering agent in a liquid base before said property altering agent is introduced into said at least two delivery lines.

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51. The method of claim 24 further comprising the step of moving said wire to convey said deposited slurry away from said headbox.

52. The method of claim 51 wherein said paper has variable a characteristic in a direction perpendicular to the movement of said wire.

53. The method of claim 24 further comprising the step of selectively introducing an auxiliary property altering agent into another one of said plurality of delivery lines before said depositing step.

54. The method of claim 53 wherein the pulp including said auxiliary property altering agent has at least one property different from the pulp including said property altering agent.

55. The method of claim 24 further comprising the step of controlling the consistency of the slurry deposited on said wire to control the diffusion of the slurry deposited on said wire.

56. The method of claim 51 further comprising the step of controlling the speed of said wire to control the diffusion of the slurry deposited on said wire.

57. The method of claim 24 wherein said plurality of locations are generally evenly spaced across said headbox.

58. A method for manufacturing paper having a variable characteristic in a cross machine direction comprising the steps of:

feeding a slurry to a distributor;

delivering said slurry from said distributor to a headbox through a plurality of delivery lines, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

selectively introducing a first property altering agent in said distributor and into a first of said delivery lines to selectively alter the properties of the slurry passing through said first delivery line;

selectively introducing a second property altering agent in said distributor and into a second of said delivery lines to selectively alter the properties of the slurry passing through said second delivery line; and

depositing said slurry received by said headbox on a papermaking wire to form paper having a variable characteristic in a cross machine direction.

59. A method for manufacturing paper having a variable characteristic in a crossmachine direction comprising the steps of:

feeding a slurry to a distributor;

delivering said slurry from said distributor to a headbox through a plurality of delivery lines, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

providing a plurality of dilution water lines, each dilution water line being coupled to said distributor and in fluid communication with an associated delivery line;

selectively introducing a property altering agent in at least one of said dilution water lines to alter the properties of the slurry in at least two of said delivery lines; and

depositing said slurry received by said headbox on a papermaking wire to form paper having a variable characteristic in the cross machine direction.

Remarks

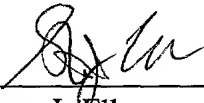
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Claims 24 and 32 have been amended, new claims 36-59 has been added, claims 1-23 and 27-31 have been canceled, the title and abstract have been amended, and substitute Fig. 1 accompanies this amendment. Marked-up copies of the claims and specification accompany this amendment, and a clean copy of page 1 of the specification accompanies this amendment. Prompt and favorable review of the application is requested.

Claims 24 and 32 have been amended to improve the clarity of the claims.

The Commissioner is hereby authorized to charge any additional fees which may be required by this paper, or to credit any overpayment to Deposit Account 20-0809.

Respectfully submitted,



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Date: June 13, 2001

MARKED-UP COPY OF AMENDED CLAIMS

24. (Amended) A method for manufacturing paper having a variable characteristic in a crossmachine direction comprising the steps of:

feeding a slurry to a distributor;

delivering said slurry from said distributor to a headbox through a plurality of delivery lines, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

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32. (Amended) A security paper having colored stripes formed by the steps of:

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delivering said slurry from said distributor to a headbox through a plurality of delivery lines, each delivery line being coupled to said distributor at a coupling location, said delivery lines being coupled to said headbox at a plurality of locations spaced across said headbox in a crossmachine direction;

selectively introducing a coloring agent in at least two of said delivery lines at the associated coupling location to selectively color the slurry passing through said at least two delivery lines; and

depositing said slurry received by said headbox on a papermaking wire to form striped paper.

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MARKED-UP COPY OF PAGE 1 OF SPECIFICATION
**METHOD FOR MANUFACTURING [COLORED
STRIPED] PAPER *HAVING VARIABLE CHARACTERSTICS***

This application is a divisional of U.S. App. Serial No. 09/342,284, filed June 29, 1999, the contents of which are hereby incorporated by reference

The present invention is directed to a method for manufacturing colored striped paper or security paper, and more particularly, to a method for manufacturing colored striped paper by introducing one or more coloring agents to the pulp before the pulp enters the headbox.

BACKGROUND OF THE INVENTION

Paper is typically manufactured by forming a pulp slurry, which is a mixture of fibers suspended in a solution of primarily water. The fibers can be, for example, cellulose-based fibers (i.e. wood fibers), in which case the slurry is termed pulp slurry. Once the pulp or slurry is produced, it is fed to a distribution system that includes a dilution water header, a distributor, and a headbox. The distributor receives the incoming pulp slurry and is typically utilized to normalize the properties of the slurry, such as its consistency, pressure, and velocity. The dilution water header supplies dilution water that is used to control the consistency of the pulp exiting the distributor. Flow exiting the distributor is fed through a plurality of delivery lines that deliver the flow to a series of nozzles distributed across the headbox. The nozzles deposit the slurry, in "jet" form, onto a moving papermaking "wire" to form a sheet on the papermaking wire. The sheet is then dewatered, pressed, dried, and treated to form the finished product.

It may be desired to make colored paper that has stripes that extend in the machine direction (i.e. extend in the longitudinal direction of the deposited sheet). However, in order to make colored paper in conventional papermaking systems, dyes, pigments or other colorants are added to the pulp slurry such that all of the pulp slurry is dyed, and the resultant paper web is uniformly colored throughout its thickness. This method does not allow for the selective introduction of color, and therefore the color of the finished paper product is limited to a single shade or color. Some paper mills produce paper sheets having a colored "marbled" appearance. These sheets are manufactured by drizzling small droplets of dye from a pipe located a few inches above the freshly deposited pulp on the wire. This method of dye application produces a

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CLEAN COPY OF PAGE 1 OF SPECIFICATION

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